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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,625	03/29/2004	Tom E. Pearson	42390.P17184	3475

8791 7590 09/29/2005

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EXAMINER

ABOAGYE, MICHAEL

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/812,625

Applicant(s)

PEARSON ET AL.

Examiner

Michael Aboagye

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03/29/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because in figures (1, 1A, 1B, 1C, and 2) the signal vias in the package substrate assembly have been mislabeled as 32B instead of 32C. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: on page 8, line 9, "The solder balls 34A" should be changed to "The solder balls 36"
- Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Searls et al. (US Patent no. 6730860) in view of Zohar et al. (US Patent no. 6754551)

Searls et al. teaches a method of constructing an electronic assembly comprising: having a plurality of conductive contact pads on a first substrate, said plurality of conductive pads consisting of conductive power pads (20A), conductive ground pads (20B) and conductive signal pads (20C); attaching a plurality of power solder balls (36A) to the conductive power contact pads, a plurality of ground solder balls (36B) to the conductive ground contact pads and a plurality of signal solder balls (36C) to the conductive signal pads; said power balls being spaced from one another, ground balls being spaced from one another and signal balls being spaced from one another; the power solder balls and ground solder balls being spaced from one another

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by a first distance and the signal solder balls being spaced from one another by a second distance which is larger than the first distance; locating the solder balls against terminals of a second substrate; and reflowing the solder balls against the bond pads by heating the solder balls, the power solder balls combining with one another and the ground solder balls combining with one another while the signal solder balls remain disconnected from one another; and allowing the solder balls to cool so that they solidify(Figures 1 and 2; column 1, line 56 – column 3, line 67); wherein one power solder ball has the same mass as one signal solder ball(see column 2, line 64 – column 3, line 14); wherein the power and ground solder balls form power and ground solder bumps located directly adjacent one another and have lengths extending substantially parallel to one another so as to have surfaces facing one another to form a capacitor; wherein a plurality of power bumps and ground bumps alternating with one another to form a plurality of capacitors (see column 4, lines 10 – 23).

Searls et al. does not teach forming a removable solder mask partially over at least a first of said plurality of conductive pads of said first substrate and a permanent solder masks on the first substrate which defines the conductive contact pads, the permanent solder mask remaining on the substrate when the removable solder mask is removed.

However Zahor et al. discloses the application of permanent and temporary (removable) solder resist (solder mask) in the manufacturing steps of printed circuit board; wherein the temporary and permanent solder masks are used to protect selected areas from certain interaction with solder alloy; temporary masks are applied to keep

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solder alloy out of selected holes and also allow temperature or process-sensitive components to be added later, they are removed by peeling or by cleaning agents, while permanent solder masks are not removed after being applied(Zahor et al. , column 4 lines 6 – 37; abstract and column 8, line 56 – column 9, line 52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modify the method of constructed the electronic assembly of Searls et al. by forming a removable solder mask on the plurality of conductive pads of the first surface, and a permanent solder mask on the first substrate in view of the teachings of Zohar et al in order to protect the selected areas from certain interaction with solder alloy or coming into contact with the solder alloy (Zohar et al., column 4 lines 6 – 37; abstract and column 8, line 56 – column 9, line 52).

The applied reference Searls et al. (US Patent no. 6730860) has one common inventor and an assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior

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inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yu et al. (US 5735452), Forehand et al. (US 5847936), Turudic (US 6078505), Mak et al. (US 6222246), Higgins, III (US 6294405) and Kalidas et al. (US 6396136) are cited in PTO-892.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Michael Aboagye
Assistant Examiner
Art Unit 1725

9/27/2005

KEVIN KERNS
PRIMARY EXAMINER

Kevin Kerns 9/27/05